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in attempting  
Criminal abortion

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POISONING BY ERGOT

IN ATTEMPTING

CRIMINAL ABORTION;

WITH REFLECTIONS UPON SOME OF THE

CAUSES OF SUDDEN DEATH

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I regret I have no better copy of my  
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Inclue me

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## POISONING BY ERGOT, IN ATTEMPTING CRIMINAL ABORTION.

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FELONIOUS attempts at criminal abortion are sometimes made the subject of judicial investigation, when malice or avarice has destroyed life by substances that popular repute invests with a fancied or real power to expel the child.

Abortion is seldom attained but by the use of medicines involving the life of both parent and offspring; and when substances, acknowledged even the most appropriate, have been ignorantly and feloniously administered, the mother, too often, perhaps, has been destroyed, when the only desire was to shelter her from harm and secure her from shame. But inasmuch as, in such a case, the intent contemplated is criminal, for the accidental murder of the mother the law holds the defendant responsible; and medical witnesses are then required to determine the nature of the death, and must of necessity answer the question whether that death was the result of poison. The influence of circumstances in complicating the particulars, may singularly embarrass the best directed medico-legal investigation: the pregnancy may not be suspected; the secrecy, perhaps suddenness, of the death may exclude all information concerning the previous symptoms; the therapeutical action of the substance suspected to have been administered may not be well understood, and the morbid changes it induces may be entirely unknown, even if revealed by a carefully conducted examination after death. These are difficulties which have recently been connected with a most instructive case of murder, occasioned by a criminal attempt to procure abortion, the first of the kind known to have occurred in this, or I believe any of the United States.\* The following, without the associated train of circumstantial evidence, is the brief history of the case, which, as one of the medical witnesses, I have been requested to detail, and which I present with imperfections observable

\* I have since become acquainted with a similar case, though here the *oil of Savin* was used; it occurred in Massachusetts. Vide *Amer. Jour. Med. Sc.* 1837. V. 21, p. 345.

throughout, and requiring all the indulgence which the reader can extend towards them :

On the 2d of May, at one in the afternoon, I was called to a patient of mine, whom I had hitherto regarded of honest and correct deportment, and found her lying dead, in the house of a stranger, who it is now known lived in adultery with her. The only intelligence obtained, was, that as some particulars concerning her pecuniary affairs were announced, she placed her hand upon her heart, was suddenly overcome, lay down and died. No medicines were discovered in the room. The deceased was lying on her back upon a bed, without her shoes on, and with no under clothes but her shift; her head and shoulders elevated by pillows, her legs stretched out and separated, and her arms extended on each side of her person. The surface of the body was warm, but presented nothing remarkable, the countenance placid, and the pupils somewhat dilated. Three hours after death, I witnessed great yellowness and lividness of the face, and an abundant froth, of a crimson color, at the mouth and nostrils, re-appearing as often as it was wiped away, while the fingers of both hands were of a dark livid hue to the knuckles.

As foul play was suspected, (though of this I was not informed) on the next day I was urged by the family to make a post-mortem examination, which was performed reluctantly, and in a hurried manner.

On exposing the body, the discoloration was found to be general. A jaundiced yellow pervaded the entire surface, and large livid blotches existed on the inside of her thighs, over the chest, on the arms and sides of the abdomen. The face was now much swollen and discolored, and the same deep colored frothy mucus from the nostrils and mouth was in such a quantity as nearly concealed it. The abdomen was considerably enlarged, and on being opened allowed the escape of a gas of a remarkable fetor, and exhibited the gravid uterus reaching to the umbilicus. The venous congestion of all the abdominal viscera at once attracted my attention. The peritoneum was highly congested; the whole tract of the intestines was covered by a net-work of venous capillaries; the liver dark, and spleen gorged with blood; the uterus, participating in the general condition of vascular turgescence, was through the distended veins most completely injected, presenting a very dark, blackish appearance; the bladder was of the natural dimension. During the removal of the uterus the common iliac vein and artery were accidentally cut, and the blood which gushed into the pelvis was very fluid. The uterus appeared to be the seat of six months gestation,—weighed nearly five pounds; the os uteri presented no marks of violence; the organ was carefully incised, the decidua reflexa and the membranes of the fetus were untouched, and the amniotic liquid was abundant. I satisfied myself that these structures had suffered no actual violence, *whatever else might have been attempted*. The fetus, which was a male, I first announced to be five months old, but while arranging it for preservation, I found it had reached the seventh month. It weighs two pounds and a half—was not accurately measured—presents short black hairs on the head; eye-lids not adherent; eye-brows visible; nails nearly, though not quite, attaining the ends of the fingers; pinna perfectly detached, and well formed; sexual organs well developed, testicles neither in the scrotum nor inguinal canals; body slightly covered with an unctuous induritus; and the epidermis peeling off in some places, from prolonged contact with the amniotic liquid.

Not anticipating any further trouble in the matter, and regarding this a case of accidental suicide while attempting abortion, I here ended my examination, without opening either thorax or cranium, which should first have been examined, could I have foreseen what was to have followed.

These cadaveric appearances, especially the external signs, were sufficient for me to determine a death by poison: for she had been seen in perfect health on the morning of her death, at 10 o'clock, as well as by myself on the day previous, and therefore died neither of yellow fever nor high bilious congestive,—the only two kinds of death which I am aware could possibly have determined such external discolorations. Before a jury of inquest, her pregnancy and death by poison I was obliged to announce, when the stomach, secure at both orifices, was submitted for analysis to Prof. Hume. On opening this organ, its



mucous membrane was decidedly hypertrophied but not softened, abraded in several spots, intensely congested in a portion of its extent, with the gastric glands considerably enlarged,—a condition of things to which we must again presently advert.

It occurred to me while reflecting on the subject, that these combined appearances might result from the exhibition of the sulphate of copper, or some medicinal fungus, such as ergot, for I had once before witnessed such an appearance of the viscera and the same external lividity,—with much less yellowness, however,—in one who being pregnant died from taking an inordinate quantity of ergot, which had ruptured the uterus.

Being then informed by Dr. Hume that he could discover none of the mineral poisons, nor opium in any shape, I suggested that he should search for ergot, which he was very soon able to detect. This was confirmatory testimony of the most satisfactory character, which the deposition of another witness was destined to strengthen: the apothecary who sold the ergot, testified that the prisoner had purchased some ounces from him, and told him "*it was for a horse which had the bots.*"

Suspicion resting upon him who purchased the ergot, who occupied the known relation of husband towards the deceased, and in whose house she was found dead; he was arraigned for trial and capitally indicted: 1st, for having feloniously administered, or caused to be administered, a quantity of ergot to provoke abortion on —, then a pregnant woman, whereof she died; and 2d, for being an accessory to the fact of the suicide of —, by means of ergot taken to procure abortion.

To support this indictment, it was necessary to prove that the defendant had ever administered, or caused to be administered, the ergot in question, or whether being administered, it actually caused her death, beyond a reasonable legal doubt. These doubts were predicated, as might have been expected, upon the incompleteness of the necropsy; and the benefit of the same, through a wise and humane law, is always given to the prisoner. The judge, therefore, regarded the case as one of suspicion, rather than proof against the prisoner, who was accordingly acquitted.

And now I beg leave to invite the reader's attention to the considerations by which I maintained that the deceased died poisoned by ergot, that he may judge for himself if the observations be correct or not, and base upon them a professional opinion.

And first, I should remark that the presumed suddenness of the death was against the supposition of poison, since the only agents which would probably act with such fearful rapidity, would be hydrocyanic or oxalic acid, neither of which was taken, nor would have produced the described appearances. The difficulty which the counsel for the defendant very naturally required that I should reconcile with my opinion of ergot producing death, consisted in the distinction between deadly and slow poisons, and "*whether ergot was not a slow poison.*" Any substance is a poison, which, to use the accustomed definition, induces death when taken internally or applied externally, without acting mechanically; thus, table salt has destroyed life in a few hours, in a case where a young lady was known to have taken half a pound of that substance—brandy is a poison—ergot is undoubtedly a slow poison, the word deadly is never attached to it by any one. So also arsenic has never been known to destroy life sooner than two or three

hours: is this any reason why it or ergot may not *act under certain circumstances* with greater rapidity? The endeavor here seems to have been to prove ergot very a slow poison, or no more a poison than any other substance to which the term is not attached. This indeed seems too generally to be the entertained opinion. It is affirmed that it has been given in large quantities without producing any ill effects. In a recent and valuable work of Professor Meigs, such an opinion will find a support from the author's experience, he states that he is "*not aware of any poisonous power it can exert*,"\* and cites Dr. Lee's case of Mrs. R., who, through the space of a month, took seven ounces without injury or abortion. Prof. Meigs refers for a full account of the substance to the work of my friend M. Cazeaux, but this author speaks very differently of its effects. Referring to the conditions which contraindicate its use, he says it should not be given "*to irritable females, who have been subject to convulsions, either during pregnancy or delivery, for*," he continues, "*ergot often produces a state of nervous exacerbation reaching even unto frenzy*."† It is forgotten that ergot is ranked among the narcotico-acrid poisons by every authority, and even among those acquainted with the fact, there appears to be a very inadequate idea of its specific action. It is spoken of as only eventuating in the production of gangrene, and we find so high an authority as M. Velpeau observing, "*that to apprehend ergotism, its use must be continued for a long time in large doses*."‡ Here no such restriction is imposed upon the administration of the drug as is carefully enjoined by M. Cazeaux, because no ill consequences seem to be apprehended but the development of gangrene.

Need I mention that in the determination of a question of this importance, we are not to take cognizance of individual cases, recorded for the illustration of other purposes, of isolated opinions expressed through misapprehension of the subject, or even the circumstance of no similar case being recorded. Were this otherwise, I could repeat that through the space of a month,  $\frac{3}{4}$ ij., and in twenty days,  $\frac{3}{4}$ x. of the decoction were given, without the induction of labor, vomiting, or any other inconvenience;§ that  $\frac{3}{4}$ iv. and  $\frac{3}{4}$ ij. were administered in five days, twenty hours and twenty-five minutes, without even producing nausea;|| and

\* *Obstetrics, the Science and the Art.* C. Meigs, M.D., p. 593. 1849.

† *Aux femmes tres irritables qui ont deja etc affectees de convulsions, soit pendant la grossesse, soit pendant leurs accouchements antecedents; car le seigle ergote cause souvent un etat d'agacement nerveux qui va quelquefois jusqu'a la fureur.* *Traite de l'Art des Accouchements.* 2d ed: p. 465, 1846.

‡ *Il faudrait donc pour faire craindre l'ergotisme, en continuer long-temps l'usage a des doses considerables.* *Traite des Accouchements*, vol. 2, p. 66. 1835.

§ *Lalague, Journ. Hebdomadaire et Universel*, p. 245, vol. xii.

|| J. Paterson, M.D. *Lond. Med. Gaz.*, June, p. 337, 1839, vide also *Amer. Journ. Med. Sc.*, vol. 25, p. 237, 1839, and *Dunglison's New Remedies*, 4th Ed., p. 266, 1843.



that for amenorrhœa, Dr. Randall exhibited in decoction  $\frac{3i}{\text{per diem}}$ , for four days consecutively, without the desired, or even any effect;\* and imitating a practice so justly inveighed against by the prudent and learned Dr. Meigs, I might, fearless of any harm to parent or offspring, and with reckless disregard of every rule, proceed to drive the child through the rigid, undilated and ergotised cervix, before its presentation is fixed, or its position adjusted in the pelvic excavation; and finally, if the sway of precedents is always to influence our opinions, then would we have searched in vain for the few cases of poisoning by Savin which chance has recorded. The diversity of circumstances influencing the action of a remedy, the quantity and mode of its exhibition, its purity or adulteration, the peculiar idiosyncrasies of the system, are too frequent to enumerate, and often too multiplied and combined to permit of generalization,—we must regard the physiology of its action, wherever that has been foreshadowed by well conducted experiments, and caring little how it has acted, be ready to affirm how it may and will act.

Before, therefore, entering upon these particulars, I would observe that I hold it as a fact uncontroverted that the subject of this narrative died poisoned. This truth was written in characters as plain as death itself. The defence, it is true, pleaded that as neither the thorax nor the cranium were opened, there was no certainty that she had not died of *rupture* of the heart, or apoplexy; but, whatever cogency such objections may, and undoubtedly do possess, in a majority of instances, it is equally true that they may have little or no weight in others. There is a method of reasoning by exclusion, which, though not as accessible to every intelligence as would be actual demonstration, and therefore not admitted by the law, is nevertheless as infallible, when accompanied by a studious appreciation of facts. Upon a similar method of investigation is based the entire plan of medical practice, and this process of inquiry alone is afforded for the detection of disease, where often life and death are involved.

The absence of any reliable information of the symptoms in this case, would be regarded as a lamentable point for the divergence of medical testimony, but for such evidence as I think points with fidelity to the truth. None with greater circumspection than myself would adduce the particulars of an imperfect post-mortem as evidence of death by poison, nor incautiously maintain that external features, upon which we are taught no reliance can generally be placed, are to be regarded as proof; but when

\* Dr. Frost's Elem. Mat. Med. p. 327, 1843.

those peculiar changes have occurred after death, and can only be ascribed to certain poisons, then they become sufficient to countenance an opinion, requiring but the testimony of the chemist to give it its full and important weight; therefore, had the above-mentioned objections been in themselves correct, they could have proved nothing with respect to this particular case, the necropsic appearances of which they could not have explained.

There is no error more universally accredited, than that a sudden death must result from apoplexy, yet the highest authorities, and Rochoux among them, disprove the assertion. It is, indeed, so rarely the case, and so much more frequently to be imputed to disease of the heart, that many deny it altogether as a cause of sudden death. Christison observes, that Devergie is the only late author of repute who maintains that it may destroy suddenly, sustaining his opinion by a case of immediate dissolution with apoplectic symptoms.\* That apoplexy does, however, produce rapid death, must be admitted, particularly if the *medulla oblongata* be the seat of disease, then death may occur instantaneously.† It may be instantaneous when the hemorrhage occurs even in the anterior lobes of the brain,‡ but the patient generally lingers several hours or even days. Apoplexy does not develop the combined yellowness and excessive lividity of the entire body, with the appearances presented in this case by the abdominal viscera, particularly the stomach; and it must be remembered, that had the brain been examined and found congested, this would not have been an unequivocal affirmation of death by apoplexy, for it is just what we would expect from a narcotic poison. But it may be argued, that extravasation caused the death, and that the apoplectic cell might have been discovered; this would have been strong presumptive evidence, but would it have been proof of a natural death? Undoubtedly not. Extravasation has repeatedly occurred from poisoning by opium,§ and what is well worthy of notice, in a death from poisonous fungi, a clot was also met with in the brain.|| Consider now the other side of the question. Had no recognizable alterations of structure been detected in the encephalon, would it be a justifiable inference that it was not apoplexy? Indubita-

\* Devergie relates the case of an elderly gentleman, complaining of headache, he coming pale, hanging down his head and dying suddenly, presenting no morbid lesions, but congestion of the cerebral membranes.—*Christison on Poisons*, Am. Ed., p. 614, 1845. See also *Seance de l'Academie de Medicine*, du Juin, 12, 1838.

† Ollivier examined a man, who having walked some distance, sat down, fell over and died in two hours. The pons varolii presented at its centre an apoplectic cell, which extended upwards beneath the quadrigemina, downwards into the olivary and pyramidal tract, tearing and almost completely destroying the oblongata.—*Arch. Gen. Med.*, v. 1, p. 276, 1833.

‡ *Arch. Gen. Med.*, vol. 27, p. 467, 1831.

§ *Lond. Med. Phys. Journ.*, Feb. 1816, and *Lond. Lancet*, 1836 to '37, p. 271.

|| *Christison on Poisons*, p. 709, 1846.



bly not. For so far as the morbid appearances of the brain are concerned, death might have resulted from simple or nervous apoplexy, noticed by Abercrombie,\* Louis,† Lobstein‡ of Strasbourg, and others, leaving not the slightest vestige of morbid action in any part of the body; though this disease, as we know, seldom terminates in death sooner than five hours; and it should also be stated that even these negative signs often coincide with indisputable cases of narcotic poisoning.§

The difficulties likely to be raised upon the circumstance of the necropsy, being incomplete, compel me now to pass in review those morbid changes producing instantaneous dissolution, which may invade either the encephalon, lungs, heart, or large blood-vessels, calling to mind the invariable absence in each instance, of the marked characters of poisoning presented by my patient.

I shall just allude to a phenomenon which, though not immediately connected with either of the organs forming the tripod of life, claims attention here, as becoming the source of instant death, and accounting for the apparent absence sometimes of any necropsic indications of the cause of such a termination—I mean the spontaneous development of a gaseous fluid within the blood, distending the venous half of the heart, interrupting circulation and producing death. The morbid appearances are general paleness and rigidity of the body; brain and membranes healthy; abdominal organs in their normal state; no abdominal tympanitis; the lungs presenting no other morbid alteration, than the mechanical congestion which sometimes follows death;|| the right half of the heart distended, as it were inflated and tympanitic; left heart empty and normal; cerebral vessels containing air; and the physical characters of the blood unchanged. ¶ Such is this rare phenomenon, bearing every resemblance to the introduction of air into the veins, and as rapidly fatal, which some years since particularly fixed the attention of Ollivier.¶¶

\* Patholog. and Pract. Researches on Diseases of the Brain, p. 211.

† Recherches Pathologiques.

‡ Arch. Gen. Méd., p. 260, vol. 23, 1830, 2d Serie.

§ In a case examined judicially by Christison, there was neither congestion nor effusion.—Christison, *idem*, p. 568.

¶ The lungs, after death, are always filled with fluid in their dependant parts, which become denser and darker than the rest; this, however, is no engorgement following death, nor indicating the position in which the body has lain, as was supposed, but is known from experimental investigation to occur immediately before death. Those who die upon the side, or while sitting, present the engorgement at the side or base of the lung—the dependant part at the time of death; notwithstanding the bodies may have lain on the belly for some hours. This I mention as important in a medico-legal point of view, as well as exhibiting the predominant influence of physical laws at the decline of the vital powers.

¶¶ Hippocrates was certainly aware of the effects of an admixture of air with the blood, and though he cites no instance of the spontaneous production of such a cause followed by death, says, in his Lib. De Flatibus: Syderationes corporis, apoplexie dicte, ex flatibus oriuntur,....si multi flatus totum corpus permeant, totus homo attonitus rediditur, si vero partem aliquam, pars illa. And further on he continues: cum spiritu copioso per totum corpus universo sanguini permixto, obstructions multe multifarie...

The supervention of death by the lungs is sometimes as rapid as if the medulla oblongata had been severed. The experiments of Leroy d'Etoilles\* demonstrate this fact, had we even no pathological evidence of their correctness. From the exquisite structural delicacy, and important relations and office of these organs, we are readily disposed to infer the instantaneousness of death upon the occurrence in them of spontaneous lesion, as these must at once interrupt the circulation; yet it is subject of surprise that few have devoted any time to the appreciation of this point of pathology, as connected with legal medicine; Lancisi, Dionis, Ollivier d'Angers and Lebert, form the few who dwell at all discursively upon the subject. Now it is deserving of notice that, in the opinion particularly of the two last mentioned authors, with whom we are not willing to join issue, sudden death is more frequently to be imputed to a disturbance of the functions of the lungs, than of the heart, or its blood-vessels. It is matter of notoriety that the ingress of air or any fluid in or about the cells of these organs, whether from without, or developed spontaneously within them, may interrupt, suspend or destroy the respiratory function, and with it life. The first of these phenomena, and by far the rarest in producing any injury to health, is *interlobular emphysema*.

*Emphysema lobulare*.—Of this disease, the accounts by Lænnec, as among the earliest, are also among the best. It differs from vesicular in being developed suddenly during violent muscular exertion; moral emotion, or rather the instant suppression of passion, has given rise to it. A violent inspiration fills every cell to the utmost, the *rima glottidis* closes, and an equally violent expiratory effort ruptures the structures, driving the air into the interlobular spaces, sometimes from thence through the areolar tissue of the mediastinum, along that of the neck, and thus into the sub-cutaneous cellular tissue of the entire body. Notwithstanding the strictures of Meriadec Lænnec, who endorses his illustrious namesake's remark, that he had never seen any one die of this affection,† several genuine

circa venas contingunt: cum igitur in crassiores et sanguine abundantes venas, copiosus aer prorupit, progressusque immoretur, sanguinis pertransitus prohibetur atque hic quidem sistitur, ibi vero tardius permeat, alibi autem citius. Morgagni however attributes a death to this cause, having found air in the blood-vessels; but the abdomen was tympanitic, gangrene seems to have been present, and it might have been due to commencing putrefaction.—*Morgagni, De Sed. et Caus. Morborum Lib. I. Ep. V. § 18.*

In the same chapter Morgagni relates three other instances on the authority of Pechlin, Groetz and Ruysch; the last two are particularly interesting. Ollivier cites three examples,—a child, convalescent from scarlet fever; a robust man, hitherto in perfect health; and a young girl 22 years old. These all died suddenly, revealing in the two first examples, general emphysematous infiltration of the cellular tissue soon after death.—*Dict. de Méd. V. 2 p. 65, and Arch. Gen. V. 1, p. 43, 1838.*

Bichat opened the body of one who died suddenly, and detected blood, frothy and full of air in the vessels of the head and neck, but in this case, the air entered the jugular vein during a surgical operation. *Rech. phys. sur la vie et la Mort. Œuv. Comp. V. 2, p. 273. 1832.*

\* Recherches expérimentales sur l'Asphyxie: Paris, 1829.

† Traité de L'Auscultation Médiate, 4th Ed. 1837. Vol. 1. p. 413



and authentic cases are recorded. Morgagni not only observes, *non omnes circa nostri initium sæculi repentinas mortes ab apoplexia fuisse, sed plures etiam a syncope, quasdam a suffocatione*,\* but relates an interesting case, which has all the appearance of being a death from emphysema. It is shortly as follows:—A sportsman, habitually short-breathed, returning from divine worship, partook of some food, was compelled to lie down, and scarcely had he time to call his wife, before he expired. The integuments were pale and cachectic in appearance, the abdominal organs healthy, the lungs inordinately distended with air, scarcely any effusion in the pericardium, the heart flaccid but very large.† As death in this instance was imputed by Morgagni to disease of the heart, I have thought proper to cite the entire case in the note, as most worthy of the reader's attention.

Piedagnel selects from among *many others of the same kind*, two cases occurring in 1820, at the hospital St. Antoine, in which the lungs were the only organs diseased, being emphysematous and crepitous.‡ Another instance, signally exemplifying the influence of excitement, and the suppression of passion over the development of this affection, is related by Ollivier: a man slapped another, who, prevented from resenting it, turned away to recover his composure, fell upon his face and died. Death was owing to the spontaneous production of emphysema in both lungs.§ Again, Pillore cites three deaths from this disease; two were old men, one 69, the other 70. The necropsy disclosed no other cause for the death but an emphysematous condition of the lungs.|| Breschet notices a case of the same kind belonging to Magendie.¶ Devergie recites two instances in which the affection was manifestly due to a preternatural exacerbation of nervous excitement—these were observed by M. M. Jadelet and Roger: a female, lively and exceedingly fond of singing, retired with her lover to bed, after a hearty supper; symptoms of suffocation suddenly overwhelmed her during sexual embrace, and she died after a short, but violent agony; pulmonary

\*Loco. cit. Lib. 1: Ep. 2, No: 4.

† Venator, qui erat quasi assidue brevispirus; hac enim voce uti juvat; cum dies jam octo se minus valere, diceret, sed de stomacho dumtaxat quæreretur, tandem, cum Sacris interfuisset, paucumque cibum sub meridiem sumpsisset, coactus se in lectulum recitare, uxore vix advocata, vivere desiit. Cadaveris cute, quæ erat cachecticis colore similis, tenuissimamque Adiposam membranam incisiss, mox Venter et Thorax aperti sunt. In illo sana omnia. In hoc vero pulmones cre erant maxime turgidi, et undique cum vicinis partibus, si modo supremas excipias, connexi, et propemodum connati, magna ut vi opus fuisset quæ costis, a diaphragmate, a mediastino avellerentur. Intra pericardium humoris ferme nihil, cor vero flaccidum, sed perquam magnum.—Loco: cit: Lib. 2, Ep. xviii. No. 14.

‡ Recherches anatomiques et physiologiques sur l'emphyseme du poutmon. Paris, 1829, p. 12.

§ Arch. Gen. Med. 1833. Vol. 1, p. 229, 2d serie.

|| These Maladies Observees a l'hospital des Nouveaux-nés, et a l'hospice de la vieillesse 1834.

¶ Dict. des Sci. Med.

emphysema with serous congestion, and froth in the trachea and bronchiae, disclosed the cause of death. A cart, in the second case, passed over the thigh and calf of a man, fracturing the femur, the chest sustaining no injury, but on dissection, the lungs were found generally emphysematous.\* Finally, Prus has observed as many as eight cases at the Bicetre and Salpetriere.†

In one of the three kinds of *œdema* of the lungs, recognized by Andral, the serous infiltration occurs so rapidly, as to induce symptoms like those of œdema of the glottis, and speedy death. Lebert believes that such a circumstance might prove instantly fatal. He, however, I think, attaches undue importance to the case recorded by Andral.‡ Those laboring under pulmonary affections, do sometimes suddenly expire when neither brain, heart nor lungs offers any appreciable explanation of such an event. But these instances, seemingly dependent upon a *nervous* spasm of the glottis and bronchial ramifications, are almost invariably sequels to diseases of a spasmodic character, such as asthma, hooping cough,—and though in one instance, Andral saw life extinguished in *twenty-four* hours, the patient previously in perfect good health, with the exception of an ulcer on the leg,§ yet there will be little danger of such

\* Annales D'Hygiene. Avril, 1841.

† Bulletin de l'Acad. Roy. de Med. May 24, 1842. There will be little reason, we hope, to apprehend the reader's remaining in doubt, whether emphysema can produce sudden death. M. Prus mentions the importance of this determination to the medical jurist, stating that a person was found dead on the highway, no lesion existed but pulmonary emphysema; the physician judiciously examined, was undecided as to the sufficiency of the cause to produce death, and conferring with a friend in Paris, learned that the question even there was not yet determined. Lennec, M. Lennec and Louis affirm that pulmonary emphysema is *never fatal*. Ferrus seems also to believe that we must look to a nervous lesion, in such cases, for the cause of death; but on such a principle every spontaneous lesion and sudden death may be ultimately referred to disorder of the nervous system; besides, emphysema does not always require this condition for its development; no such cause obtained in Morgagni's case of the sportsman, already mentioned, nor in many others which occurred at Bicetre and Salpetriere among the old. Emphysema is regarded as always coexistent with other affections, such as disease of the heart, which latter produces the death, but this is by no means proved. Neither Rochoux nor Royer Collard subscribes to this opinion; the latter inquired particularly of the physicians of the hospitals of Paris, who all denied any decided relations between these diseases. The array of authorities is considerable which hold that emphysema can, and has destroyed life, suddenly; these are Van Swieten, Magendie, Breschet, Piedagnel, Andral, Leroy d'Etoilles, Ollivier, Dergie, Bouvier, Prus, Poisseuille, Rochoux, Floyer, Storck, and Lebert. Mr. Bouillaud never has seen the most apparently dangerous attacks prove mortal, but refers such an event, when it does happen, to *traumatic* emphysema; and indeed, we believe that this opinion will at once reconcile all conflicting sentiment, and allow of our ranking even Lennec and Louis among our list, as from the causes which produce the disease, we cannot fail to recognise a traumatic lesion as the result, as when, for example, it follows moral excitement, violent efforts, &c., &c.; and even when it occurs among the old, who have suffered from chronic bronchitis, it is the sudden ingress or expiration of air through the narrow and obstructed tubes, which again ruptures the vesicles, and establishes the disease. Now how is death produced by this affection? M. M. Poisseuille and Bergey observe, that emphysema diminishes the arial surface of the lungs, the disappearance of the septa of several vesicles resolves these into a *single* one, whose arial surface is less than the sum of the surfaces of the vesicles from which it was formed; sanguification is thus interrupted, and death follows more or less rapidly according to the extent of the lesion. The air passing into the intervascular and interlobular tissue, compresses the blood-vessels, and arrests the flow of blood. Death, then, is induced by diminution of the respiratory area, and obstruction of the capillaries. As Piedagnel supposes the air may pass sometimes into the arterial system.

‡ Andral records a case in which the patient died unexpectedly, in a few days, with previous pulmonary disturbance, expectoration, lungs œdematous with melanotic infiltration.—*Clinique Medicale*, T. 3, p. 231.

§ Loc. cit: V. 3, p. 225.



eases becoming the subject of judicial inquiry, as they are not examples of death supervening suddenly in perfectly healthy constitutions.

*Pulmonary Congestion.*—Lebert, to whom we have particularly referred on this subject, considers three stages of pulmonary congestion exempt from inflammation, properly so called, as ending sometimes in immediate death; these are: sanguineous congestion and exhalation on the inner surface of the bronchial tubes without pulmonary engorgement, congestion with engorgement, and pulmonary apoplexia.\* These conditions in robust constitutions, appearing as idiopathic, and causing death, are neither generally known nor admitted. Watson observes that *pulmonary hemorrhage, strictly idiopathic, has been more frequently affirmed than proved.*† Such cases, however, may sometimes occur, as Lebert, Andral, and others have shown. Andral met with a death from pulmonary hemorrhage, unaccompanied by tubercles;‡ and, as no mention is made of the heart, this organ was doubtless perfectly healthy. Lebert relates the following case: A soldier died suddenly from the same cause, after a copious meal; the heart and all the other organs were sound, but the bronchial ramifications, on one side, filled with reddish and frothy blood.§ He also cites another, occurring again after a meal, in a scrofulous patient, but here there were tubercles. Simple hemoptysis, with or without tubercles, may therefore produce sudden death. The second kind of congestion is a stasis of the blood, within the pulmonary parenchyma, rendering the lungs dense and heavy. This is effected either rapidly or slowly. Innumerable instances of rapid death from such a cause might perhaps be multiplied, but we will only mention those referred to by Lebert.

Spontaneous pulmonary congestion will arise at times among the robust and plethoric in those addicted to intemperance, or from a metastasis of some habitual hemorrhage. Morgagni records two exemplifications of this disease, occurring among women. In one of these the congestion was due, in his opinion, to a metastasis of the catamenia to the lungs.|| Dionis gives the history of a servant, who, while in attendance upon the Duke of Bourgogne, fell dead; both lungs were in that state of engorgement termed *splenization*: and that of the Marquis de Louvoir, who, in the act of reading a letter to the King, was obliged to desist, and died in a quarter of an hour.¶

\* Arch. Gen. Med., v. 1, 1838 p. 389.

† Lectures on the Principles and Practice of Physic. 1847, Am. Ed. p. 609.

‡ Loc. Cit. v. 2, 154.

§ Arch. Gen., v. 1, pp. 396 and 398.

|| Loc. Cit. Ep. xix., No. 51, and Ep. xxxvi. No. 17.

¶ Dissertation sur la mort. subite. 2d Ed., 1718.

Lebert interprets several of Andral's cases, and one of Louis', as additional examples of the kind. Ollivier furnishes us another in the person of a robust and perfectly healthy individual, who, rushing in a burst of passion against his landlord to strike him, turned pale, tottered, and fell into the very arms of him whom he threatened. This becoming the subject of legal inquiry, Ollivier instituted an examination, and demonstrated that pulmonary congestion was the cause of death. Both lungs were remarkably dense and hard, presenting a dark red color when incised, and the ramifications of the pulmonary arteries and veins were filled with clotted blood.\*

Of the second kind of congestion, in which the engorgement is of a chronic formation, but not revealed by any symptoms whatsoever, the patient appearing in perfect health, Lebert has collected two cases, as happening at the Hotel Dieu. The subjects of these were old persons, afflicted with diseases of the urinary organs. They were seized suddenly with dyspnœa and suffocation, and died, one in twenty, the other in a few minutes.†

In pulmonary apoplexy, properly so called, the sanguineous congestion is restricted, as it were, to circumscribed spots, where the blood is some time extravasated; the tissue immediately surrounding these apoplectic centres being perfectly healthy, though sometimes itself containing infiltrated blood. This condition of things is often accompanied by laceration of the tissues, and of one or more blood-vessels. I need mention no examples of this affection producing instantaneous death, for they are numerous, and every one is acquainted with the fact.

Closely allied to these cases is the development of inflammatory congestion, which, singularly inexplicable as it may appear, Lebert informs us, not unfrequently takes place without any signs disclosing its existence, but such as become at once the precursors of death. In other words, *latent pneumonia* may produce immediate death, and the necropsy expose the several degrees of the disease, whether acute or chronic, demonstrating thereby that it was latent, and not engendered spontaneously. This extraordinary event seems almost always confined to the aged, for, at the Salpetriere, they were regarded as sudden deaths from old age, until Mr. Hourmann,‡ conjointly with

\* Arch. Gen. vol. I, 1833, p. 233. There is another example of death, apparently from this cause, recorded in the *Lancette Française*, vol. 2, No. 80, and in the *Archives*, vol. xxii, 1830, p. 111. A student of law, about eighteen or twenty, at one of the public balls, while waltzing continuously for a length of time, fell senseless and expired. The integuments of the lower extremities, thirty-six hours after death, were scarlet red, livid blotches on the chest and arms; no blood issued from any of the orifices of the body; the brain was somewhat congested, but the lungs were perfectly livid, conveying, when pressed in the hand, the sensation of a mass of cotton.

† Arch. Gen., 1838, vol. ii, p. 57.

‡ Arch. Gen., 1836, vol. xii, p. 164.



Dechambre, examined into their nature. They describe two cases, one particularly interesting: the patient, an old woman, eighty-five, was chewing a biscuit at the time of her death; the inferior lobe of the right lung was at the suppurative stage through its entire thickness, and no foreign body was discovered in either the trachea or bronchiae.\* Lebert details, from his personal observation, four others: two of these individuals were 75, one 66, the other 78. In them the several stages of pneumonic inflammation were discovered. To these Lebert associates the well known case of Ollivier, to show that instances of instances of the kind manifest themselves in the young also. A woman, 22 years old, at the fifth month of pregnancy, had complained for some time of general uneasiness, but particularly so on the morning of her death; she got up at eight o'clock and dressed, and at nine was found lying dead on the floor of her chamber. This was the result of *pleuro-pneumonia*, of recent development.

If we have referred at considerable length to death by the lungs, it is on account of its great importance to the Medical Jurist, and the imperfect knowledge generally entertained upon these points of pathology, and not from any resemblance which such cases present to a death from narcotico-acrid poisons. Marshall Hall would have us leave the lungs out of consideration altogether in every case of sudden death, referring the event to arrested circulation in the coronary vessels of the heart, or to lesion of the medulla.† Diseases of the heart are more familiarly recognized as eventuating in instant death, and we shall do little more than enumerate them, as they are severally treated at length in all works on practice; we only remark that they are not always preceded by premonitory symptoms, but may seize an individual in apparent good health. Rupture of the heart, or of either of the large vessels immediately at their exit from the organ, fills the pericardium with blood, compresses the heart, and generally produces *instant* cessation of its action;‡ the face and general surface become very pallid; the vessels of the neck and head have, nevertheless, been found sometimes distended and the depending parts livid.

An inevitable sentence of death is a malady which Jenner termed *Syncope anginosa*, the angina pectoris of authors; the seat of this affection is the heart; the coronary vessels have been found ossified or cartilaginous; the organ

\*Arch. Gen. Med. v. xxii. p. 164.

†Gulstonian Lectures. London. 1842.

‡Morgagni died of rupture of the heart, and so did George the II., and the Dutchess of Brunswick. M. Ollivier records the remarkable concurrence of rupture of the pulmonary artery and pericardium just at the instant that an individual received a wound in the neck; so extraordinary a coincidence gave rise to judicial inquiry, and M. Ollivier demonstrated the true cause of death. Arch. Gen. Med., 1838, vol. i, p. 36.

loaded with fat, and the aorta diseased; no other signs present themselves; it is essentially a disease of old age, and altogether remediless.\* Hypertrophy, softening and ulceration of the heart, may produce sudden extinction of life. In one instance of softening and ulceration, cited by Dr. James Andrew, he observed considerable lividity of the head and neck, but which did not extend to other parts; the face on the contrary, showed a *life-like aspect*, and possessed a tint of a rosy hue.† Metastasis of disease of the heart, hydatids, etc., are additional causes for the same fatal accident; and Winslow reckons *spasm* of the heart another.‡

*Asphyxia idiopathica*§ is a morbid disturbance of the functions of the heart, which destroys life with terrible celerity, but of its pathology, we really know little more than that the heart is found entirely empty and flaccid; this flaccidity is not invariable, for Rochoux has in one instance met the auricles full of blood;|| the patient turns pale, and swoons away into a mortal syncope, from which there is scarcely time to attempt, if there were means to procure, a recovery. Inasmuch as the disease is peculiar to parturient women from the sixth month to after delivery, and rarely met with among men, it particularly commands attention here, as it may be supposed to present an embarrassing resemblance to the concurrent circumstances of the case which I have here recorded. Idiopathic Asphyxia has been confounded with what I think is very improperly regarded as the apoplectic convulsions of pregnant women. I am reluctant to award any such special malady to pregnant females, and am strongly disposed to believe that the phenomenon is nothing more than ordinary apoplexy, occurring during gestation. The affection of which we speak is therefore entirely different from apoplexy, which rarely, *if ever*, proves as rapidly mortal. Denman has cited several instances of death from what must be certainly regarded as the asphyxia of Chevalier: a female, previously complaining of pain in her head and impaired vision, endeavored to change her posture while in labor, and instantly expired, in the act of moving; another, as the child was about to be born, threw herself back and died immediately; and again, another female after delivery sat up in bed to take nourishment, fell back

\* John Hunter died of this disease.

† *Lancet*, 1845, vol. 2, p. 264.

‡ *London Lancet*, 1846, Nov.

§ Chevalier assigns this appellation to a disease which he regards as a morbid insufficiency on the part of the capillaries to propel the blood, whereby the heart, expelling its contents, receives no fresh supply, and dies flaccid. Without expressing an opinion as to the correctness of this explanation, I will only remark that the above phraseology sanctions a physiological error, for though the capillaries are muscular, they exert no agency over the propulsion of the blood.

|| *Recherch, sur l'Apoplexie*, p. 159.

and died. Dr. Jenner made the necropsy, and found the heart flaccid, and not a drop of blood in either the auricles or ventricles.\*

In our patient, the actual condition of the stomach, the bright yellowness of the entire body, particularly that of the face, the crimson froth at the nostrils and mouth, and the lividity of all parts of the body, especially the fingers, admit the affirmation that neither of the several pathological conditions which we have been reviewing, caused her death; caertainly not idiopathic asphyxia, which leaves no such concomitant phenomena; and from what has been said of apoplexy, few would admit this either, without its accompanying symptoms. If any evidence of an apoplectic or epileptic state was present, and was known to be the effect of natural causes, and not unlawful means, why are we kept ignorant of what interest alone would have scrupulously noticed and faithfully recited? Nor is the yellowness of the corpse to be referred to the jaundice of pregnant women; this is a vital phenomenon, which exists prior to death, whereas, in the present instance, it was developed a few hours after. Such a combination of abnormal appearances are never the sequels of any of those diseases likely to produce sudden death, nor has an extensive acquaintance on my part, with the changes after death, frequently as late as fifteen days before and after inhumation, ever displayed them. The exhibition of narcotic poisons, on the contrary, almost always induces such an assemblage of morbid indications, and ergot, (though the fact be not generally known,) does develop the most pernicious, the most poisonous effects in any constitution, and especially in those manifesting a peculiar idiosyncrasy, and of such appeared to be this patient, to whose previous history I will now allude.

Mrs. — had been a widow seven years, and was the mother of a healthy boy, having passed through her pregnancy without any untoward symptom; of a highly nervous temperament, easily excited and readily impressed, she was in the enjoyment of a fair share of health, though sometimes inconvenienced by the consequences to which her natural liability exposed her; thus it was that about a year and some months past, at the death of her father, I was called to witness in her a severe attack of hysteria, which was only relieved by chloroform. Before resorting to this remedy, I remained a passive observer of the intensity of the attack, during which the eyes were fixed with a ghastly stare, the opisthotonic contractions of the muscles were so continued and violent, that for half a

\*Introduction to Midwifery, p. 427.



minute at times, her body was completely arched, so as to rest only upon the occiput and heels; no froth at the mouth, nor contortions of the countenance, breathing hurried, pulse full and irregular, and no groans. And on another occasion, a month before her death, some of these symptoms were again repeated, with no re-appearance of convulsions, but a desire to retch, and after a slow return to consciousness, she complained of vague uneasiness in her legs, feet and hands, requesting that the latter should be put in warm air and water. This is her history up to my last attendance, at which time, neither her family nor myself suspected her actual position.

After a careful review of the causes operating suddenly upon life, I am still willing to maintain that poison was the cause of the fatal accident which has befallen this unfortunate woman; and that ergot was that poison, I have every reason to believe, and will enter into such particulars as may, perhaps, satisfy the scrutiny of the most sceptical.

It is not generally remembered, as we have already intimated, that ergot is a poison. As such, however, it is ranked authoritatively, by its acknowledged effects. Indeed it is more than seven hundred years since this fact was well attested by Sigebert de Gremblour,\* and for upwards of five centuries it was recognised as possessed of no other properties than those of a decided acro-narcotic poison. Camerarius† was the first at this period of its history, to announce its peculiar action over the uterus, and the unfavorable reception it then met in its newly assumed character of an ecbotic, sufficiently attests the diffidence and reluctance which accompanied the use of a substance fraught with the most pernicious influence upon the human constitution. We speak of it here in its character of a narcotico-acrid poison, and we shall only allude to its therapeutical action so far as may conduce to the more perfect apprehension of our subject.

A parasitic fungus invading the rye, engenders a disease in its growth: the fungus, developed within the grain, between the teguments and the perisperm, increases in size, bursts the envelop of the grain, protrudes between the palea and is pushed forward by the perisperm. These excrescences, from offering a fancied resemblance to the spur of a cock, have suggested for the spurred rye the official name of *Ergot*. As an article of food, spurred rye is not always attended with deleterious effects, but under the influence of conditions not justly appreciated, they may burst with uncontrollable violence upon an entire commu-

\* Recueil des Histoires des Gauls et de la France. cl. 3, p. 259.

† Ramsbotham's Process of Parturition, 1845. A. A.

nity. Epidemics of the kind have raged at various periods at Sologne, Blois and Montargis in France, in Germany, Switzerland, Denmark, Sweden, Bohemia, and other parts of the continent of Europe;\* and at no very remote period in Germany again.† Yet these consequences are the result of a simple admixture of rye with the food; how much greater may we anticipate will be its action, when the medicinal agent is separately exhibited as an article of the *materia medica*?

The poisonous effects of ergot are developed by two separate trains of phenomena, differing in nature according to the amount of the substance taken, and the length of time its use has been continued, and to these collective symptoms the term of *ergotism* has been applied. When persisted in for some time as an every day food, it deteriorates the entire system, emaciating and inducing a cachetic habit, accompanied by a sensation of formication or the creeping of insects over the body, which the Germans express by the word *Kriebelkrankheit*. This impaired vitality of the constitution terminates in the manifestation of gangrene in the extremities, and sometimes in spontaneous sloughings, and this constitutes *gangrenous ergotism*. Of this we have no more to say.

When under other circumstances it is resorted to for a short time, and even in smaller quantities, the supervention of another and more dangerous order of symptoms occurs, which often proves fatal, and invariably so in epileptic individuals, or such as are in any wise predisposed to similar nervous aberrations.‡ The powerful agency of ergot over the nervous centres, is especially exemplified in this phase of the disease. Here, dimness of sight, vertigo, nausea, but not always vomiting, violent cardialgia, and numbness of the limbs appear in rapid, but irregular succession, followed with increased heaviness of the head, and a return of sensibility in the limbs which gives rise to the sensation of formication, and sometimes of a burning heat; there is not unfrequently aberration of the intellectual faculties and entire loss of sight, and finally, opisthotonos declares itself by the most violent and painful contraction of all the muscles of the body, during the convulsive efforts of which incredible force is required to extend the spasmodically flexed limbs and fingers; the tongue is sometimes lacerated during the convulsive movements of the jaw, and a yellowish, greenish or bloody froth appears at the mouth; the pupils are either dilated or contracted, and the face yellow with purple blotches over the

\* Tissot. *Philos. Trans.* vol. 55, p. 108.

† Christison. *Loc. Cit.* p. 717.

‡ Vide Orfila. *Méd. Légale*. T. 3, p. 483, 3d Ed: 1836.



surface; yellowness invades the integuments, which also become livid after death; and the pulse remains regular, but is somewhat depressed, often small and imperceptible; a comatose state very soon supervenes, and the scene closes in death in twenty-four or forty-eight hours, though it may last a week or even months, and such are the fearful results of the use, in certain seasons, of rye-bread. It must be observed that this state of nervous erythsm most frequently precedes the sopor and coma of complete narcotism, but these primary symptoms are sometimes of so short duration, and so slight, as to pass unobserved, or are often wholly wanting—the rapid supervention of narcosis, being the only evidence which is furnished of approaching danger; this we shall see has occurred from the use of the ergot in substance. Much depends upon the freshness and integrity of the ergot in producing such effects, and these, when most acute, exhibit a strong resemblance to the action of many other fungi. Christison observes, that poisonous fungi also sometimes produce narcotic symptoms alone, and cites several examples: a man by mistake stewed a number of the *Agaricus campanulatus*, and not above ten minutes after he began to eat them, he was suddenly made dim of sight, and giddy, lost his recollection, trembled, and was weak—he walked two hundred and fifty yards, when his countenance expressed anxiety, he reeled about as if intoxicated, and could hardly speak; a youth from eating another variety, was seized in a similar manner, with the addition of convulsive spasms, furious delirium, and dilated pupils; after the use of emetics, the stomach pump, and stimulants, they both recovered.\* There is, indeed, an endless variety in the symptoms of these acro-narcotic poisons, all of which induce a depraved condition of the system, altering the nature of the blood, and very soon effecting a change in the color of the skin, which becomes yellow and livid. Christison says that the morbid appearances in those poisoned by these substances, are but imperfectly known; but this much is ascertained, however,—the body turns as we have said, yellow and livid; the blood is fluid, so as to flow from the natural openings in the dead body; the abdomen is distended with fetid air; in some places the stomach is gangrenous and far advanced in decomposition; the lungs gorged with blood as also the vessels of the brain; the sinuses of the dura-mater are found exceedingly distended, the membranes highly injected, and the substance itself of a scarlet color; sometimes extravasation occurs, for Picco met a clot in the cerebellum, the size of a bean.†

\*Christison. Loc. cit. p. 705.

†Christison. Loc. cit. p. 709.

With such examples before us, it ought at once to be inferred that the noxious principle itself must act even more rapidly and violently, particularly when the special sort of effect depends upon idiosyncrasy. The peculiarities of temperament must vary and modify the action of these poisons astonishingly; in certain individuals, the simple odor of the most fragrant plants may be regarded as relatively poisonous, and when endured but for a few minutes develops cephalalgia, palpitations, syncope, convulsions, vertigo, aphonia, and finally asphyxia;\* the most delicious kinds of fishes exert a very deleterious effect upon many; and of the class of poisons of which we speak, the best and most esculent mushrooms may very rapidly prove injurious. On the authority of Christison we will mention that Sage relates a man's death in a few hours from eating the *tuber cibarium*, or common truffle.† Under similar circumstances, we should be prepared to witness the separate symptoms of irritation, or narcotism, or the rapid transition from one to the other during the administration of ergot, even if no instances of the kind had ever been indicated; but fortunately, amidst the imperfection of our knowledge on this point, there is sufficient evidence of the sort, as we will now show.

Various degrees of the severity of the action of ergot, when administered even in comparatively small doses, have been recorded, the effects not being referred to any peculiar constitutional proclivity obnoxious to such manifestations, and doubtless many more are to be found, had we the space and leisure for such a purpose.

In a thesis of M. Flaubert on ergot, in contending against uterine inactivity, we find the relation of a case in which Mrs. A—— experienced a violent pain in the right thigh, followed by complete numbness of the limb and foot, which were pale and cold; her slipper fell off several times without her being conscious of it, and she remained in this condition for fifteen days after her confinement.‡ An English physician, Dr. Michell, seems also to have noticed this disturbance in the nervous system, when he says the effect of ergot on the mother, is to cause a deadness of all the parts of the body.|| The same author mentions that the impression on the nervous system is such, that a woman inquired what had been given her, exclaiming, "*I am dying!*" A pregnant woman, according to Mr. Smith, a few minutes after taking ergot demanded, "What have you given me? it flies all over me like lightning."§

\* Orfila. Loc. cit: V. 3, p. 483.

† Loc. cit. p. 703.

‡ These, Paris, 1822. Obs: 13, pp. 22, 23.

§ Wright, Edin. Med. Surg. Journ. V. 63, p. 13, 1849.

¶ Wright. Loc. Cit. p. 26.



On the authority of Drs. Maunsel and Cusack, other instances of the kind are mentioned; the former says that two drachms of ergot, administered to a certain parturient woman, were sufficient to render her delirious in half an hour. Half a drachm given in two doses on another occasion, produced in fifteen minutes intense headache, depressed pulse, and stupor; and again, two doses of one drachm each, produced muttering delirium, coma, and livid face.\* Dr. Cusack relates that when ʒjss. were given, the pulse sunk from 120 to 90, and considerable stupor supervened;† and on three other occasions half drachm doses induced symptoms of *anaplectic kind*, the pulse not exceeding 40 in the minute.‡ Dr. Simpson, of Edinburg, informed Dr. S. Wright (to whose valuable essays on the subject we are indebted for some of these references) that small doses, in one instance, induced symptoms of intoxication.§ Dr. Charles Hooker, of New Haven, speaks of the narcotic properties of ergot, and in a highly interesting article, relates his experiments as demonstrating that the ecboic and narcotic properties may be entirely separated, so that it may be used to promote the uterine contractions, without inducing *narcosis*, which, he says, *it is liable to, do.*||

In another order of cases which have come under my notice, much more decided effects have resulted from even the *infusion* of ergot, convulsions and complete narcosis being produced, and the patients escaping only through the sufficiency of such remedial agents as were called into requisition.

Dr. Isaac Hull,¶ U. S. N., has described the results of an overdose of ergot, in a lady of delicate constitution, with a peculiar idiosyncrasy against all narcotics. The ergot, he states, had lost some of its activity from age, and of this, he exhibited twelve ounces of the infusion made with one drachm every half hour, he soon perceived that his patient *was in a state approaching insensibility*. The pulse was feeble, about 65, and the limbs covered with a cold sweat. Shortly the palpebræ began to swell, likewise the lips and fauces, and tears flowed copiously; the Schneiderian membrane seemed much stimulated; there was coryxa, and great difficulty of breathing through the nose and injection of the vessels of the conjunctivæ; the lips and palpebræ began to puff as if stung by a bee, and gradually assumed a livid appearance. The power of deglutition was now nearly lost; the voice became feeble;

\* Lond. Med. Gazette, June 1834. p. 605.

† Lond. Med. Gazette, idem. p. 600.

‡ Dublin Hospital Reports. Vol. 5.

§ Ed. Med. Surg. Journ. V. 53, 1840, p. 10.

¶ Boston Med. Surg. Jour. V. 10, 1834.

† Geddings' North Amer. Arch. V. 2, p. 31, 1836.

the jaws were fixed, and with difficulty could an answer be elicited. Previous to arriving at this point, she complained of pain in every *nerve*, and a sensation of emptiness of the head; carbonate of ammonia was administered and frictions resorted to, and as the pulse rose and the patient recovered, there was a general perspiration, the matter of which emitted the peculiar fetor of ergot.

Dr. E. H. Bishop, in a communication to Professor Dunglison regarding the powers of ergot, states that he has "*once seen unpleasant effects, when giving the powder; the labor was protracted and narcotism produced.*"\*

For another case of poisoning by ergot, too interesting not to be cited at length, we are indebted to Dr. John Beckwith, of Raleigh, North Carolina.† In a letter to Dr. McKee, he thus relates the case:

"Mrs. —, aged 30, enjoying excellent health, was, during her fifth labor, induced to take *thirty grains of ergot*, for the purpose of restraining a real or supposed tendency to hemorrhage after the expulsion of the placenta. In about an hour she complained of nausea and palpitation, and presently of dimness and confusion of sight. Vomiting was encouraged, and she *threw up most of the ergot*; the effect, however, continued and increased. The pulse, usually about 80, sank to 40, with frequent intermission, double vision soon followed, and then entire blindness; in two hours more delirium came on, succeeded by heavy sleep and snoring. She could be roused, not to consciousness, but to low muttering wonderings; temperature of skin low, with free perspiration. Next morning, the hands, feet, ears and nose became purple, and much of the surface assumed a mottled aspect; then came on strong and general convulsions. When they subsided her color slowly returned, and from that time all the symptoms of poisoning gradually disappeared and by evening she was decidedly out of danger. Through the day she complained much of soreness and tightness about the throat, and the tongue was swollen. The memory was tardily recovered; almost every incident connected with her labor, even the birth of her child, was entirely forgotten. There was extraordinary secretion of urine."

Another interesting case is reported by M. J. Wright, of Nottingham:

"In attendance upon Mrs. S——, the mother of two children, and observing the inefficiency of the labor pains, Dr. W—— administered two drachms in infusion in two doses. She was delivered in half an hour from the time of taking the first dose. In a few minutes she became sick, and vomited what appeared to be the medicine recently taken. Presently afterwards she lost all voluntary motion, and even the power of utterance. Her heart beat very rapidly, and her breathing was extremely laborious. The room presented to her the impression of water excessively agitated on its surface; she compared it to the 'foaming of a troubled sea.' She lay motionless during the earlier part of the day, and micturated abundantly. She declared that such was her helplessness at one time, that 'had the child been falling out of bed, or had the house been on fire, she could not have made the least muscular effort.'"<sup>‡</sup>

That these are indeed the effects of ergot, and to be referred with every plausibility to its action, is fully substantiated by direct experiments upon animals. These investigations

\*Am. Med. Intelligencer, 1837, p. 330.

†Dunglison's Amer. Med. Intel., Oct. 1833, p. 218.

‡Edin. Med. Surg. Journal, V. 53, p. 12, 1840.



have been made by several physiologists, both upon animals, and so far as practicable, upon the human subject; but those by far the most complete and satisfactory are by Dr. Wright,\* and more recently by Bônjean of Chambéry.†

Whether injected into the arterial or venous systems, or introduced into the stomach, the effects of ergot, (always poisonous,) have varied according to the peculiar temperament of the animals. Solutions of ergot injected into the vessels prove rapidly destructive, in a concentrated form, at once influencing the nervous centres, brain and chord, and paralyzing the animal instantly, *no resistance to its effects being discernible*;‡ and even in a weak solution, progressively impairing the energies of the system, and exhausting the vital force. When exhibited through the stomach, local irritation of that organ is always produced, evinced by nausea, hiccup and vomiting. The fatal results are much less rapid in these latter experiments, as gradual marasmus, gangrene and suppurations are most frequently developed, but where a peculiar predisposition engenders convulsions, spasms, and as in one instance mentioned by Bonjean, where in an entire family the convulsive form alone manifested itself, then narcosis may follow, and death is more rapid. Such is the local irritation of a solution of ergot, that if injected into the rectum, it produces tenesmus, disury and priapism, and in connection with this remark, it is worthy of attention, that among Dr. Wright's experiments, the injection of the solution into the veins produced congestion of the mucous surface of the stomach, which was deeply injected with blood-vessels, dark spots variegating its pyloric extremity, and the whole gastro-intestinal track presenting on some occasions a *deep claret color*, with bloody mucus towards the rectum.¶ Frequently again the hypnotic effect seems to supervene so rapidly as to anticipate completely the convulsive phenomena; neither spasms, convulsions, nor any nervous symptoms declaring themselves, the body grows cold, the heart flutters, the eye is insensible to touch or light, and death soon follows.§ Another remarkable pathological condition is the congested state of the trachea and bronchial ramifications, filled as they often are with frothy mucus. The lungs themselves are sometimes engorged, and extravasated blood was also noticed in the gastro-colicomentum,¶ and throughout all these experiments, the frequent discharge of the contents of the bladder and rectum, is a circumstance that should attract notice.

\* Vide Ed. Med. Journ. 1839, and two subsequent numbers for 1840.

† Journal de Pharmacie.

‡ Wright, Loc. cit. V. 52. p. 328.

§ Loc. cit. Exp. vi. p. 33.

¶ Vide Exp. VII.

‡ Exp. IX.

The ergot in substance, and even the infusion or decoction, as we have seen, are all able to give rise under circumstances not always easy of explanation, to a cohort of symptoms and changes, which sooner or later usher in death. Experiments with the oil of ergot, supposed itself to be either the vehicle or the active principle of the grain, is poisonous to a high degree.

If any additional evidence is required of the pernicious effects of ergot, this may be found in numerous experiments instituted upon perfectly healthy individuals; references may be made to those of J. C. Lorinser,\* which are quite satisfactory, so far as they go. The distinguished and far-famed Professor Dunglison† caused experiments of the kind to be performed by Drs. Cottmann and McKee, then resident physicians of the Philadelphia Hospital, which clearly establish the narcotic properties of ergot. And still more recently, Dr. Germain Sée‡ and Dr. Hardy|| have justified, by further experiments, these conclusions regarding the sedative property of ergot, the latter remarking that even the pulsations of the foetal heart are also diminished. De Gravina,§ another experimenter upon this substance, tried the effects upon himself; he only took twenty-four grains, which in three quarters of an hour, produced vertigo, nausea, and attempts to vomit, excessive epigastric pain, great oppression at the head, the pulse fell from 65 to 54, and respiration decreased considerably per minute. These sedative effects are not to be regarded as the primary, but secondary action of ergot—this substance, as we have already said, is a narcotico-acrid poison, and narcosis is more frequently its secondary and final result.

What we have now said, furnishes ample and sufficient proof of the powerful energies of this agent upon the animal economy, and whatever theory of its physiological action we adopt, it will be able, perhaps, to explain them.

The first point of importance which we take occasion to mention, is the rapidity with which the special effects of ergot are manifested. Dr. Hardy¶ examined into this question, and the accuracy of the assertion that only a few minutes—six or seven, and rarely fifteen—are required for the development of its action upon the uterus, will be confirmed by the experience of those who have availed themselves of it. We cannot stop here to inquire at length, whether this immediate supervention of its effects is proof sufficient that it acts upon the sentient extremities.

\* Rust's Repertorium, and Arch. Gen. Med. 1823, V. 13, p. 440.

† Amer. Med. Intelligencer, Sept. 2, 1839, p. 161.

‡ These, Sur les propriétés du Seigle ergoté.

§ Dublin Journ. May 1-45.

¶ Br. For. Med. Rev. 1830, V. 10, p. 655.

¶ Loc. cit.



of the nerves of the stomach, or those spent upon the inner tunic of the blood-vessels, which would seem to be the case, as time sufficient for its absorption scarcely intervenes, or whether indeed it must pass into the circulatory stream before it can exert its influence. It is very likely, if I may express an opinion when such discrepancy of sentiment exists, that it acts in both ways. That it enters the circulation is probable, for we know that narcotics do. Prof. Dunglison\* saw a new-born infant completely narcotized, the mother having taken morphia previous to its birth; Ramsbotham† also witnessed just such a case when opium had been taken, and Barbier d'Amiens‡ found that a child at the breast was similarly influenced, whose mother had taken the wine of opium. Wright's experiments lead me to believe that the young *in utero* are sometimes affected without the ergot having materially influenced the parent. But Ramsbotham§ has presented us with four instances in which the fœtus died a few hours after birth, by convulsions; and we have seen that Dr. Hardy observed its effects upon the fœtal heart. It most undoubtedly enters the circulation when the general economy is so infected as to fall into a state of marasmus and gangrene, but the speedy revelation of its power, when it sometimes overwhelms the nervous centres, or again induces a preternatural exacerbation of nervous irritability, evinced by convulsions, spasms and aberration of the intellectual faculties, is equally well explained by its sudden agency upon the nerves of the inner coats of the vessels. Whatever we assume as the truth, one fact is positive, which is its influence upon the cerebro-spinal axis; this is declared by the abnormal feeling in the limbs and rest of the frame, by the cephalagia, dilation of the pupils, and convulsions. These disturbances are not always present when the ergot has passed into the circulation, and when they do occur, they are not always in dependence upon the perturbations in the circulatory system.

The ergot, affecting the spinal chord and brain, is in my opinion the true expression of its mode of action and supposed specific agency upon the uterus, which power many agree that it displays through the medium of the nervous and not the arterial system, but their explanation of the phenomenon differs. Dr. Wright suggests that the ergot's sedative action upon the system, by a general rather than a local impression, "favors the disposition of the uterus to expel its contents." Though it is true that de-

\* Dunglison's Gen. Therap. and Mat. Med. 4th Ed. 1850, V. 1, p. 341.

† Process of Parturition, p. 433.

‡ Dunglison's Op. Cit.

§ Ramsbotham Op. Cit. vide Appendix.

pression of the system often solicits the energies of a distended or excited organ—such as the stomach or the rectum—and in this way, perhaps, the uterus; yet were this theory correct, the parturient power of ergot could only be adventitiously displayed, would always require to be preceded by marked evidence of depression, and could not be depended upon as invariable in its effects. I am rather inclined to confess that in its operation upon the spinal marrow, it may resemble strychnine in exciting the reflex action of that centre, which, transmitted to the spinal nerves in this manner, produces the apparently special influence upon the uterus; and this, I reluctantly admit, is restricted to that organ, but believe it to extend to others under the dependance of the chord; much might be advanced in support of such an opinion. In Dr. Wright's sixth experiment, he says: "the *sphincter ani* contracted powerfully, and there was every appearance of severe tenesmus."\* Barbier d'Amiens† exhibited the advantages of ergot in paraplegia, and as regards its efficacy in affections of the bladder and rectum, when these organs have been paralyzed, we may mention the following authorities: Steinbeck,‡ Petrequin,|| Houston,§ Hargrave,¶ Allier,\*\* Guer-rant,†† and more especially P. S. Pagan,‡‡ who in an interesting memoir has subjected the question to experimental tests of a very satisfactory character. In all these instances, decided effects were produced upon the pelvic viscera, and calculi were even expelled the bladder during micturition, amidst hypogastric pain, formication, and disturbance of sight. There seems to be unequivocal proof of this mode of action upon the spinal chord, and attention is directed to the circumstance, that when consorted with the rapidity of its effects, and the natural proclivity which idiosyncrasy may awaken, either for the development of convulsions or narcosis, a more adequate appreciation may be entertained of the power of this drug.

Now the application of all these principles and facts to the case before us, exhibits not only the possibility, but the probability that ergot, either in infusion, decoction or powder, poisoned the patient. She was a fit subject for the occurrence of such fatal results: previously afflicted in two attacks with well-marked opisthotonos and emprosthotonos, and nervous depression of the vital energies, it is natural to infer that though enjoying good health, in a con-

\* Loc. cit. v. 52, p. 323.

† Rev. Med., 1839.

‡ Lancet, 1843, v. I, p. 531.

§ Bulletin de Therapeutique, Mars 1842.

¶ Lancet, 1844, v. I, p. 700.

‡ Idem.

\*\* Med. Chirur. Rev. July, 1839.

†† Jour. de Med. et de Chir., Nov. 1839.

‡‡ Memoire sur l'ergot; son action therap. et son emploi medical. Aix, 1841.

stitution so readily impressed and so easily overcome, an over-dose, as we have seen in the above cases and experiments, might at once develop strong convulsions, and the resiliency of the powers of life be subdued, and a fatal termination secured by adscititious symptoms of narcosis, suspending and extinguishing existence. The yellowness of the integuments and the mottled state of the body—the congestion of the capillaries of the head and neck, and to a certainty of the brain itself—the great development of gas, and the fetor accompanying it, are all particularly characteristic of ergot. The gas, by distending the abdomen and driving the diaphragm into the thoracic cavity, indirectly compressed the lungs, the bronchial tubes of which, with the trachea, were filled with a bloody froth, and probably also with the substances regurgitating from the stomach, as the frothy mucus revealed the same odor and color of the liquid found in the latter organ, and in this manner this colored substance was subsequently forced through the nostrils and mouth. The particular mode of death contributed to increase the congested state of the abdominal viscera. and although all this may have been the effects of a single dose, yet we have reason to suspect that it may have resulted from the repeated use of ergot, which possesses, I believe, a cumulative action, and this leads me to a reconsideration of the condition in which we found the stomach. It is true that Dr. Hume considered this organ as indicating an intense degree of disease, and gangrenous in certain parts; that its mucous membrane exhibited a most unusual appearance is positive; as we have already stated, it was intensely congested in many parts, hypertrophied and abraded; I may add, that the rugæ on its surface was raised in elevations, black and resembling melanosis, and of a hue somewhat darker than that of the contained liquid. At first I also thought that this was sufficient to establish the existence of true gangrene, but since I have experimented, as I have already mentioned to my friend, I must be allowed to dissent from my previously expressed opinion. The portion which, upon washing the stomach, fell as detritus to the bottom of the vessel, was not sphacelus nor gangrene, but a simple disorganization after death, which is in itself equally expressive of the action of ergot—a substance, according to Bonvoisin, highly conducive to putrefaction. The actual condition of the viscera was unquestionably due to the action of ergot, the presence of which in the contained liquid was clearly demonstrated,\* but I believe it to have been

\* The tests used for its detection were precisely those employed by Christison on a similar occasion, in which ergot was detected amidst the presence of several other substances—such as *savin*, *cantharides*, etc., criminally used to procure abortion.



the sojourn of the colored and highly irritating poison in contact with the mucous surface, which produced all these phenomena. We must remember that many writers, but especially Dr. Yelloly, maintain that often a high degree of vascular repletion, amounting to a dark color, is noticed where perfect health has shown that no disease existed; the actual contact of a colored irritant may tinge, and even corrode the heart after death, by chemical action: corrosion takes place rapidly, but ulceration, which is a vital act, requires time. The only means by which we may determine, then, whether violent inflammation existed previous to death, which unmistakable symptoms alone would settle, is the detection of the indications of inflammatory action, redness, adhesion, production of pus, pseudo-membranes or their plastic materials in process of formation. But here there was no such evidence. The long protracted contact of the liquid in the cul-de-sac of the stomach produced the softening, for after death even the gastric juice may sometimes act chemically upon that part; such was the opinion of Hunter, supported by many other writers—Carswell, Adams, Allan Burns,\* and Jæger,† though the latter believes that diseased action is generally necessary to elaborate gastric juice so endowed with acetic acid as to become corrosive.

Putrefactive infiltration, or a blackish extravasation, gave rise to this appearance of sphacelus. Of this I convinced myself, by suspending the stomach for a time in diluted alcohol, and transferring it gradually to the pure liquid. The cleansing which it thus underwent divested it of its blackness, leaving a marked blush over one part of its surface, and one or more small abrasions. These I term abrasions, for they cannot be considered as ulcers, as there exists no inflammatory circles around them. The disappearance, by these means, of such singular traces of disease, is a point of great interest to the medical jurist, for it shows that in this, like in other tissues of the body, we may detect such extravasations as occur before, from those produced after death. Simple imbibition in the tissues disappears, but any change of a vital character becomes incorporated in, and identified with, the texture of the part—alcohol having no effect upon it; this I have frequently noticed in preparing anatomical specimens. But here, though no sphacelus nor gangrene can be admitted, yet there certainly exists disease—the lining membrane is hypertrophied, and there is a well marked blush upon its surface in some parts. This suggests, that if she had not ta-

\* Vide Carswell's *Recherches sur la dissolution chimique ou digestion des parois de l'estomac après la mort*, etc., etc.

† *Journal d'Hufeland*, 1811-1813.

ken ergot before, some other medicine of an abortive character must have been used; but I incline to the belief that ergot was given during this time, and that probably the attack under which she labored, a few weeks previous to her death, was some of the transient symptoms of ergotism. The singular burning experienced in the limbs, and the extreme prostration of her system, are to be noticed with particular interest in this connection.

We therefore conclude, that from the powers of ergot and from all the circumstances of this interesting case, this unhappy woman was a victim to the poisonous properties of a medicine, operating upon a constitution whose liabilities guarantied the most fearful consequences. To these, indeed, must be referred those many difficulties which so often perplex the physician; for, in the language of another, we hold that "idiosyncrasy, as arising in most cases from inappreciable causes, is the most absolute and inevitable difficulty in medical evidence, since no accumulation of instances, such as might suffice for the removal of all other doubts, can secure us wholly against this source of error."







